

The listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A method for forming a dual damascene feature, comprising:
  - forming vias in an etch layer;
  - providing a trench patterned mask over the etch layer;
  - etching a trench into the etch layer, wherein the etching the trench comprises a cycle of:
    - forming protective sidewalls over the sidewalls of the vias, which prevent faceting and fence formation; and
    - etching a trench through the trench patterned mask; and
    - stripping the mask; and
  - repeating the trench cycle at least three times.
2. (Canceled)
3. (Original) The method as recited in claim 1, wherein the trench etch cycle is repeated at least five times.
4. (Original) The method, as recited in claim 3, wherein the passivation and etching are performed in a common plasma processing chamber.
5. (Original) The method, as recited in claim 4, wherein the deposition uses a non-directional deposition and the etching step uses a directional etching.
6. (Original) The method, as recited in claim 5, wherein the wafer is bombarded by energetic ions with ionic energy greater than 100 ev during the deposition step.
7. (Original) The method, as recited in claim 5, wherein the passivation is a non-etching or a

negligibly etching deposition.

8. (Original) The method, as recited in claim 5, wherein the deposition uses a gas mixture containing at least one of H<sub>2</sub>, CH<sub>3</sub>F, CH<sub>2</sub>F<sub>2</sub>, CHF<sub>3</sub>, C<sub>4</sub>F<sub>6</sub>, C<sub>4</sub>F<sub>8</sub> as the polymer former and at least one of CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, and NF<sub>3</sub> as the etching gas.
9. (Original) The method, as recited in claim 5, wherein the deposition step uses a mixture containing CF<sub>4</sub> and H<sub>2</sub>.
10. (Original) The method as recited in claim 9, wherein the CF<sub>4</sub> to H<sub>2</sub> gas flow ratio is in the range of 0.6:1 to 1.4:1 by volume flow rate.
11. (Original) The method, as recited in claim 7, wherein the deposition process is selected from at least one of chemical vapor deposition and sputtering.
12. (Original) The method, as recited in claim 1, wherein the etch layer is a low-k dielectric material.
13. (Currently Amended) The method, as recited in claim 1, wherein the via holes are not filled with a sacrificial filler material prior to the start of the trench plasma etching process.
14. (Original) The method, as recited in claim 1, wherein the via holes are filled with a filler material to no more than 50% of the via hole height prior to the start of the trench plasma etching process.
- 15-16 (Canceled)
17. (Withdrawn) An apparatus for etching a layer under an etch mask, wherein the layer is



chamber.

18. (Withdrawn) The apparatus, as recited in claim 15, wherein the computer readable media further comprises computer readable code for performing the at least one deposition step and at least one etching step in an alternating fashion for a plurality of times.

19. (Withdrawn) The apparatus, as recited in claim 16, wherein the etchant gas source comprises an etching gas component source and a polymer former gas component.

20. (Previously Presented) The method, as recited in claim 8, wherein the etching uses an etching gas mixture with components and wherein the forming the protective sidewalls uses a deposition gas mixture with components, wherein at least some of the components of the deposition gas mixture are not mixed with at least some of the components of the etching gas mixture.

21. (Previously Presented) The method, as recited in claim 5, wherein the etch layer is a low-k dielectric layer without a trench stop layer.

22. (Previously Presented) The method, as recited in claim 1, wherein the etch layer is a low-k dielectric layer without a trench stop layer.